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ABSTRACT: An amplified key is presented to the 4 species of *Dioscorea* that represent the Dioscoreaceae in Florida. Two native species, *D. floridana* and *D. quaternata*, are recognized as distinct from *D. villosa*, and are characterized as to morphology and range. *Dioscorea alata* and *D. bulbifera* are reported as escaped and naturalized. *Dioscorea batatas* is excluded.

DIOSCOREACEAE R. Br.

Yam Family

Two native *Dioscorea* occur in Florida. The characteristics which distinguish them have been poorly understood, and a clearer understanding requires simultaneous consideration of the other species of *Dioscorea* native to eastern North America.

The indigenous wild yams, from eastern Canada south to Florida and west to Texas, are of a section of *Dioscorea* otherwise restricted to Asia (R. Knuth, Das Pflanzenr. IV. 43. 171-173. 1924). The relationships of the North American species, if indeed there are more than one, have been subject to wide swings of professional judgment. Many of the characters deemed highly diagnostic by some workers, such as seeds and rhizomes, are often unavailable in herbarium materials, and other investigators have been unwilling to recognize distinctions based on equivocal vegetative morphology. The dioecious habit of the plants further erodes the availability of discriminatory characteristics, with useful features of the male inflorescence and the size and shape of the fruit absent from at least a moiety of specimens.

A synopsis of United States *Dioscorea* has been provided by H. H. Bartlett (U.S. Dept. Agric., Bureau of Plant Ind., Bull. 189. 1910). Although no longer fully current, Bartlett's study has remained highly influential in establishing the specific delimitations and morphological characteristics used by recent workers. In many instances this influence is not direct; J. K. Small (Manual of the Southeastern Flora, 1933), by making a paraphrased and highly condensed version of Bartlett's study readily available, has focused attention on selected portions of Bartlett's data and, perhaps, has tended to obscure the scope of morphological diversity apparent to students of the genus who carry their studies beyond the herbarium.

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Bartlett recognized five species of *Dioscorea* in the eastern United States. He acknowledged two species with the lower internodes suppressed, the associated leaves appearing verticillate. These were *D. quaternata* J. F. Gmel., a widespread southern species extending into northern Florida, with straight little-forked rhizomes, and *D. glauca* Muhl., a montane species separated by its glaucous leaves and stout often-forked much-contorted rhizomes. This last character was of significance because of the supposedly greater medicinal virtue of rhizomes from the montane plant, a discrimination slowly eroded during the latter half of the nineteenth century by depletion of the stock of *D. glauca* and adulteration by rhizomes of other species.

Bartlett maintained three species of *Dioscorea* in which the lower internodes were of normal length, all leaves being clearly alternate. One was the common northern *D. villosa* L., extending south to Texas as var. *glabrifolia* (Bartlett) W. Stone. (Bartlett actually employed *D. paniculata* Michx., a name usually seen as synonymous, following the analysis of S. F. Blake (*Rhodora* 20:48-49. 1918).) Bartlett's remaining two species, both of his own discovery, were *D. hirticaulis* Bartlett, a pubescent-stemmed plant of the Atlantic Coastal Plain, and *D. floridana* Bartlett, from South Carolina to northern Florida.

Later authors, at times operating with limited benefit of field experience, have often been unwilling to maintain these species. M. L. Fernald (*Rhodora* 39:399-402. 1937), unable to see in the herbarium the rhizome features described by Bartlett, remarked that he could "find no character of flower or fruit to separate *D. glauca*," and reduced it to a variety of *D. quaternata*; he later withdrew recognition altogether. R. Knuth (1924), writing in Germany, recognized only *D. villosus* at the specific level, with the other entities treated as subspecies. H. E. Ahles (*Jour. Elisha Mitchell Sci. Soc.* 80:172. 1964; A. E. Radford et al., *Manual of the Vascular Flora of the Carolinas*, 1968) combined *D. quaternata* and *D. glauca* with *D. villosa* and reduced *D. hirticaulis* and *D. floridana* to varietal status. A recent study at Duke University by Shu-Fun Au, unfinished due to the death of its author, tentatively recognized *D. hirticaulis* and *D. floridana* but combined all other entities without distinction under *D. villosa*.

There remains, however, a body of independent opinion, based on regional but careful field observation, that suggests the finer segregation employed by Bartlett more accurately reflects the true situation. E. L. Braun in Ohio (*The Vascular Flora of Ohio*, 1967), J. A. Steyermark in Missouri (*Flora of Missouri*, 1963), and most notably C. C. Deam in Indiana (*Flora of Indiana*, 1940) acknowledge in their respective areas many of the biological entities described by Bartlett. Not only morphology and range, but habitat preferences, seem to vary among the tentative species. A modern study, with full attention to the characteristics observed by Bartlett and these more recent students is greatly to be desired.

In the absence of such a study, both the species to be recognized in Florida and the characters by which they may most effectively be separated remain tentative. The two names employed by Bartlett, *D. quaternata* and *D. floridana*, are accepted in the present analysis. In Florida at least, the living plants they represent are adequately distinguished even when sympatric. Some specimens, particularly of very young plants or those collected late in the season, may be ambiguous, but by-and-large both herbarium specimens and plants examined in the field may be assigned on the basis of several well-correlated characters. Reliance on the male inflorescence being solitary or fascicled in the leaf axil, a character selected by Bartlett and emphasized by Small and by Ahles, obscures the presence of more consistent and regularly available traits. These are employed in the accompanying key.

DIOSCORIA L.

Yams

1. Aerial tubers absent; leaves moderate-sized, seldom reaching 15 cm. in length (including petiole); stems twining upward to the left.
 2. Lowest internodes of stem absent or greatly shortened (on mature plants), the lowest 4 - 7 leaves thus appearing whorled; distal end of petiole and adjacent lower ribs papillose to puberulent; inflorescences in median axils, seldom extending to stem apex, the subtending leaves not reduced; male inflorescence usually a solitary panicle; perianth parts yellow with conspicuous sharply-defined glandular orange dots; low climbing vine from long slender rhizome; river banks and floodplains, moist hammocks, infrequent; north Florida, Escambia County east to Alachua County. April - May.
WILD YAM. *D. quaternata* J. F. Gmel.
 2. Lowest internodes of stem normally elongate, all leaves thus alternate; petioles and blades wholly glabrous; inflorescences in median or upper axils, the upper subtending leaves often reduced; male inflorescence usually of one large and one or more smaller secondary panicles in each leaf axil; perianth parts yellow without orange dots or with poorly defined orange blotches; low climbing vine from elongate cord-like rhizome; moist to dry hammocks, uncommon; north Florida, from the Apalachicola River (Jackson and Calhoun counties), east to Duval County, and south along the Gulf Coast to Hernando County (Chinsegut Hill). June - July.
WILD YAM. *D. floridana* Bartlett
1. Aerial tubers present; leaves large, often 15 - 20 cm. or more in length (including petiole); stems twining either to left or right.

3. Stems twining upward to the left (visible even in short sections as twisting of the surface markings); leaves alternate; leaf blades broadly cordate with rounded lobes; aerial tubers subspherical, smooth-surfaced, potato-like, to 12 x 10 cm.; vigorous high-climbing vine from perennial fleshy roots; cultivated and now becoming extensively naturalized, peninsular Florida. [A variable species, some forms of which in tropical areas provide both aerial tubers and fleshy roots suitable for food. The strain found in Florida bears aerial bulblets that remain nauseous and inedible even after repeated boiling and washing.]

AIR-POTATO.

D. bulbifera L.

3. Stems twining upward to right; leaves opposite; leaf blades narrowly cordate with angular often truncated lobes; aerial tubers elongate, rough-surfaced with soft-fleshy protuberances, to 10 x 3 cm.; vigorous vine from massive perennial edible roots; cultivated and sparingly escaped, Escambia, Leon, Alachua, Lee, Dade counties and elsewhere. October.

WHITE YAM.

D. alata L.

Excluded Species

Dioscorea batatas Decne. Cinnamon Vine. An Asiatic species often grown in the North as an ornamental vine. In Florida it does not thrive and has not escaped. Small aerial tubers (1 - 1.5 cm. dia.) are borne in the axils of the panduriform leaves.